

Notice of Allowability

Application No.

10/676,220

Examiner

Hong C. Kim

Applicant(s)

BHATTI, SHAHZAD H.

Art Unit

2185

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 9/29/06.
2. ☒ The allowed claim(s) is/are 1, 14, 3-13, 17, and 19-24 (renumbered to 1-20).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 6/28/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Detailed Action

1. Claims 1, 3-14, 17, and 19-24 are presented for examination. This office action is in response to the amendment filed on 9/29/06.
2. The information disclosure statement (IDS) submitted on 6/28/06 is being considered by the examiner.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
4. Authorization for this examiner's amendment was given in a telephone interview with Dan C. Hu, Attorney for Applicants Reg. No. 40,025) December 8, 2006.

5. Application has been amended as follows:

In the claim:

Cancel claim 18.

Amend claims 17 and 20 as follows:

17. (Currently Amended) A method of accessing data,
comprising:

storing, by a storage system, data in hierarchical data structures, each hierarchical data structure containing plural levels of data objects;

storing a table of identifiers mapped to corresponding, ranks of block addresses in the storage system; receiving, at the storage system from a host system, a request containing an identifier of one of the hierarchical data structures; and

converting, based on accessing the table by the storage system, the identifier in the request to one or more block addresses to specify corresponding blocks in a storage medium,

wherein receiving the request comprises receiving the request in which the identifier is not translated by the host system.

20. (Currently Amended) An article comprising at least one computer-readable storage medium containing instructions that when executed by a processor cause a storage system to:

store data in hierarchical data structures, each hierarchical data structure containing plural levels of data objects, and each hierarchical data structure stored in a respective group of blocks of a storage medium in the storage system;

store a table of identifiers mapped to corresponding, ranges

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of block addresses in the storage system;

receive, from a host system, a request containing an identifier of one of the hierarchical data structures, wherein the identifier in the request is not translated by the host system; and

convert, by accessing the table, the identifier in the request to one or more block addresses to specify corresponding blocks in the storage medium of the storage system.

REASONS for ALLOWANCE

6. The following is an Examiner's statement of reasons for the indication of allowable subject matter: renumbered claims 1-20 are allowable over the prior art of record because a search does not detect the combined claimed elements as set forth in the claims 1-20. Specifically, claims are allowable over the prior art of record because none of the prior art of record teaches or fairly suggests a system, method, article for accessing data comprises a storage medium containing blocks identified by block addresses, the storage medium to store data in hierarchical data structures, each hierarchical data structure containing plural levels of data objects, and each hierarchical data structure stored in a respective group of the blocks; a storage location to store a table having plural entries, each of the plural entries mapping a corresponding identifier of a hierarchical data structure to a respective range of block addresses; and a controller to in response to a request containing an identifier of at least one of the

hierarchical data structures, generate one or more block addresses based on the identifier in the request by accessing the table; and access one or more blocks indicated by the one or more block addresses as described in the specification and together with combination of other claimed element as set forth in the claims. Therefore, claims 1-20 are allowable over the prior art of records.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the Issue Fee and, to avoid processing delays, should preferably **accompany** the Issue Fee. Such submissions should be clearly labeled "Comments on Statement of Reasons For Allowance."

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hong C Kim whose telephone number is (571) 272-4181. The examiner can normally be reached on M-F 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571) 272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 whose telephone number is (571) 272-2100.

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9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

10. **Any response to this action should be mailed to:**

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

or faxed to TC-2100:
(703) 872-9306

Hand-delivered responses should be brought to the Customer Service Window (Randolph Building, 401 Dulany Street, Alexandria, VA 22314).

H Kim
Primary Patent Examiner
December 8, 2006



Attachment

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Shahzad H. Bhatti	§	Art Unit:	2185
		§		
Serial No.:	10/676,220	§		
		§	Examiner:	Hong Chong Kim
Filed:	October 1, 2003	§		
		§		
For:	Generating One or More Block	§	Atty. Dkt. No.:	200207307-1
	Addresses Based on an	§		(HPC.0094US)
	Identifier of a Hierarchical	§		
	Data Structure	§		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

UNOFFICIAL AMENDMENT

Dear Sir:

Please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

Date of Deposit: _____

I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent Office (Fax No. (571) 273-8300) on the date indicated above.

Ginger Yount

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Amendment Dated September 29, 2006
Reply to Office Action Mailed June 29, 2006

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

- 1 1. (Previously Presented) A storage system comprising:
 - 2 a storage medium containing blocks identified by block addresses, the storage medium to
 - 3 store data in hierarchical data structures, each hierarchical data structure containing plural levels
 - 4 of data objects, and each hierarchical data structure stored in a respective group of the blocks;
 - 5 a storage location to store a table having plural entries, each of the plural entries mapping
 - 6 a corresponding identifier of a hierarchical data structure to a respective range of block
 - 7 addresses; and
 - 8 a controller to:
 - 9 in response to a request containing an identifier of at least one of the hierarchical
 - 10 data structures, generate one or more block addresses based on the identifier in the request by
 - 11 accessing the table; and
 - 12 access one or more blocks indicated by the one or more block addresses.
- 1 ~~2.~~ (Cancelled)
- 1 3. (Previously Presented) The storage system of claim 1, wherein the storage location is
2 part of the controller.
- 1 4. (Previously Presented) The storage system of claim 1, wherein the storage location is
2 part of the storage medium.
- 1 5. (Original) The storage system of claim 1, wherein the request comprises one of a read
2 and write request.
- 1 6. (Original) The storage system of claim 1, wherein the request comprises another
2 identifier to identify one of the data objects in the hierarchical data structure.

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1 7. (Original) The storage system of claim 6, wherein the request comprises one or plural
2 pointers to point to one or more locations within the data object identified by the another
3 identifier.

1 8. (Original) The storage system of claim 1, wherein each hierarchical data structure
2 comprises data objects sharing a common characteristic.

1 9. (Original) The storage system of claim 8, wherein each hierarchical data structure
2 comprises a root data object and additional data objects at lower levels of the hierarchical data
3 object.

1 10. (Original) The storage system of claim 1, wherein at least one of the data objects is
2 associated with a function invocable by the request to perform a predefined task.

1 11. (Original) The storage system of claim 10, wherein at least one of the data objects is
2 associated with an attribute accessible by the request.

1 12. (Original) The storage system of claim 1, wherein at least some of the data objects are
2 associated with respective functions invocable by one or more requests to perform predefined
3 tasks.

1 13. (Original) The storage system of claim 12, wherein the at least some of the data objects
2 are associated with attributes defining characteristics of respective data objects.

1 ~~14~~ ² (Original) The storage system of claim 1, wherein each hierarchical data structure
2 includes at least one leaf object, a root object, and at least one intermediate object coupled
3 between the leaf object and the root object.

1 ~~15-16~~ (Cancelled)

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1 ~~17~~¹⁴. (Currently Amended) A method of accessing data, comprising:
2 storing, by a storage system, data in hierarchical data structures, each hierarchical data
3 structure containing plural levels of data objects;
4 storing a table of identifiers mapped to corresponding ranges of block addresses in the
5 storage system;
6 receiving, at the storage system from a host system, a request containing an identifier of
7 one of the hierarchical data structures; and
8 converting, based on accessing the table by the storage system, the identifier in the
9 request to one or more block addresses to specify corresponding blocks in a storage medium,
10 wherein receiving the request comprises receiving the request in which the identifier is
11 not translated by the host system.

1 ~~18~~. (Cancelled)

1 ~~19~~¹⁵. (Previously Presented) The method of claim ~~17~~¹⁴, wherein receiving the request comprises
2 receiving the request that further includes another identifier to identify one of the data objects in
3 the one hierarchical data structure.

1 ~~20~~¹⁶. (Currently Amended) An article comprising at least one computer-readable storage
2 medium containing instructions that when executed by a processor cause a storage system to:
3 store data in hierarchical data structures, each hierarchical data structure containing plural
4 levels of data objects, and each hierarchical data structure stored in a respective group of blocks
5 of a storage medium in the storage system;
6 store a table of identifiers mapped to corresponding ranges of block addresses in the
7 storage system;
8 receive, from a host system, a request containing an identifier of one of the hierarchical
9 data structures, wherein the identifier in the request is not translated by the host system; and
10 convert, by accessing the table, the identifier in the request to one or more block
11 addresses to specify corresponding blocks in the storage medium of the storage system.

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1 ~~21~~. (Original) The article of claim ~~20~~¹⁶, wherein the instructions when executed cause the
2 storage system to further store functions associated with data objects of the hierarchical data
3 structure, each function to perform a predefined task on a respective data object.

18
1 ~~22~~. (Original) The article of claim ~~21~~¹⁷, wherein the instructions when executed cause the
2 storage system to further:
3 receive a second request; and
4 invoke at least one function associated with at least one of the data objects in response to
5 the second request.

19
1 ~~23~~. (Original) The article of claim ~~22~~¹⁸, wherein the instructions when executed cause the
2 storage system to further:
3 store attributes associated with the data objects;
4 receive a third request; and
5 access attributes associated with at least one of the data objects in response to the third
6 request.

20
1 ~~24~~. (Original) The article of claim ~~23~~¹⁹, wherein receiving the request comprises receiving a
2 request containing a second identifier to identify one of the data objects in the one hierarchical
3 data structure.

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REMARKS

The amendments have been made in response to a proposal by the Examiner on December 1, 2006, in which the Examiner indicated claims 1-14 are allowable, and that claims 17 and 20 would be allowable if the "table" feature of claim 1 were added to those claims. Claims 17 and 20 have been amended accordingly to place them in condition for allowance.

Allowance of all claims is respectfully requested.

Respectfully submitted,

Date: _____

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